

CLAIMS

What we claim as our invention is:

1. A method comprising:
 - perforating a steel plate;
 - forming a devolatilizer nozzle from said steel plate; and
 - heat treating said devolatilizer nozzle.
2. The method of Claim 1 wherein said heat treating increases the yield strength of said devolatilizer nozzle.
3. The method of Claim 1 wherein said heat treating increases the tensile strength of said devolatilizer nozzle.
4. The method of Claim 1 wherein said devolatilizer nozzle has a yield strength of at least about 110 ksi.
5. The method of Claim 1 wherein said devolatilizer nozzle has a yield strength of at least about 200 ksi.
6. The method of Claim 1 wherein said devolatilizer nozzle has a yield strength of at least about 270 ksi.
7. The method of Claim 1 wherein said devolatilizer nozzle has a tensile strength of at least 140 ksi.
8. The method of Claim 1 wherein said devolatilizer nozzle has a tensile strength of at least 210 ksi.
9. The method of Claim 1 wherein said devolatilizer nozzle has a tensile strength of at least 290 ksi.

10. The method of Claim 1 wherein said perforations comprise holes of no more than about 0.01 inches in diameter.
11. The method of Claim 1 wherein said perforations comprise holes of no more than about 0.03 inches in diameter.
12. The method of Claim 1 wherein said perforations comprise holes of no more than about 0.05 inches in diameter.
13. The method of Claim 1 wherein the thickness of said steel plate is from about 0 to about 0.75 inches.
14. The method of Claim 1 wherein the thickness of said steel plate is no more than about 0.4 inches.
15. The method of Claim 1 wherein the thickness of said steel plate is no more than about 0.25 inches.
16. The method of Claim 1 wherein said devolatilizer nozzle comprises at least about 500,000 perforations.
17. The method of Claim 1 wherein said devolatilizer nozzle comprises at least about 1,000,000 perforations.
18. The method of Claim 1 wherein said devolatilizer nozzle comprises at least about 1,500,000 perforations.
19. The method of Claim 12 wherein said devolatilizer nozzle comprises a center-to-center hole distance of at least about 0.08 inches.
20. The method of Claim 12 wherein said devolatilizer nozzle comprises a center-to-center hole distance of at least about 0.13 inches.

21. The method of Claim 12 wherein said devolatilizer nozzle comprises a center-to-center hole distance of at least about 0.18 inches.
22. The method of Claim 1 further comprising annealing said steel plate prior to forming a devolatilizer nozzle.
23. The method of Claim 1 wherein said steel plate comprises 420 stainless steel.
24. The method of Claim 1 wherein said steel plate comprises 420F stainless steel.
25. The method of Claim 1 wherein said steel plate comprises 440A stainless steel.
26. The method of Claim 1 wherein the capacity of said devolatilizer nozzle is from about 0 to about 75,000 pounds per hour.
27. The method of Claim 1 wherein the capacity of said devolatilizer nozzle is from about 20,000 to about 50,000 pounds per hour.
28. A devolatilizer nozzle comprising a heat treated and perforated steel plate.
29. The nozzle of Claim 28 wherein said devolatilizer nozzle has a yield strength of at least about 110 ksi.
30. The nozzle of Claim 28 wherein said devolatilizer nozzle has a yield strength of at least about 200 ksi.
31. The nozzle of Claim 28 wherein said devolatilizer nozzle has a yield strength of at least about 270 ksi.
32. The nozzle of Claim 28 wherein said devolatilizer nozzle has a tensile strength of at least 140 ksi.
33. The nozzle of Claim 28 wherein said devolatilizer nozzle has a tensile strength of at least 210 ksi.

34. The nozzle of Claim 28 wherein said devolatilizer nozzle has a tensile strength of at least 290 ksi.
35. The nozzle of Claim 28 wherein said perforations comprise holes of no more than about 0.01 inches in diameter.
36. The nozzle of Claim 28 wherein said perforations comprise holes of no more than about 0.03 inches in diameter.
37. The nozzle of Claim 28 wherein said perforations comprise holes of no more than about 0.05 inches in diameter.
38. The nozzle of Claim 28 wherein the thickness of said steel plate is from about 0 to about 0.75 inches.
39. The nozzle of Claim 28 wherein the thickness of said steel plate is no more than about 0.4 inches.
40. The nozzle of Claim 28 wherein the thickness of said steel plate is no more than about 0.25 inches.
41. The nozzle of Claim 28 wherein said devolatilizer nozzle comprises at least about 500,000 perforations.
42. The nozzle of Claim 28 wherein said devolatilizer nozzle comprises at least about 1,000,000 perforations.
43. The nozzle of Claim 28 wherein said devolatilizer nozzle comprises at least about 1,500,000 perforations.
44. The nozzle of Claim 37 wherein said devolatilizer nozzle comprises a center-to-center hole distance of at least about 0.08 inches.

45. The nozzle of Claim 37 wherein said devolatilizer nozzle comprises a center-to-center hole distance of at least about 0.13 inches.
46. The nozzle of Claim 37 wherein said devolatilizer nozzle comprises a center-to-center hole distance of at least about 0.18 inches.
47. The nozzle of Claim 28 wherein said steel plate comprises 420 stainless steel.
48. The nozzle of Claim 28 wherein said steel plate comprises 420F stainless steel.
49. The nozzle of Claim 28 wherein said steel plate comprises 440A stainless steel.
50. The nozzle of Claim 28 wherein the capacity of said devolatilizer nozzle is from about 0 to about 75,000 pounds per hour.
51. The nozzle of Claim 28 wherein the capacity of said devolatilizer nozzle is from about 20,000 to about 50,000 pounds per hour.
52. A method of processing polymer resins comprising:
 - feeding polymer into a devolatilizer nozzle; and
 - devolatilizing said polymer as it passes through perforations in said devolatilizer nozzle;

wherein said devolatilizer nozzle comprises a heat treated and perforated steel plate.
53. The method of Claim 52 wherein the capacity of said devolatilizer nozzle is from about 0 to about 75,000 pounds per hour.